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MEDIAEVAL VERSIONS OF ARISTOTLE'S *METEOROLOGY*

By F. H. FOBES

There were current at the end of the Middle Ages two complete Latin versions of Aristotle's *Meteorology*—the "Vetus Versio," of which books i to iii were from the Arabic and book iv was from the Greek, and the "Nova," wholly from the Greek. In the Vetus¹ book i begins, "Postquam precessit rememoratio nostra de rebus naturalibus"; the book-divisions vary considerably with the different MSS; book iii—according to the Greek MSS—ends, "rememoratione communi tunc determinemus rememoratione exquisita unamquamque earum"; book iv—according to the Greek MSS—begins, "quoniam quidem quatuor causae determinate sunt elementorum harum quidem iuxta coniugationes," ends, "ex hiis constantia velud hominem plantam necnon cetera huiusmodi (huiuscemodi)," and is regularly followed, without title or other sign of division, by the *De mineralibus* ("terra pura lapis non fit . . . res quedam extranee"). In the Nova² book i begins, "De primis quidem igitur causis nature"; the book-divisions correspond with those of the Greek MSS; book iii ends, "communiter quidem igitur dictum est de hiis omnibus sigillatim autem considerandum intendentibus circa unumquodque genus"; book iv begins, "quoniam autem quatuor causae determinate sunt elementorum harum autem secundum coniugationes," and ends, "ex hiis constituta velud hominem plantam et alia talia."

There was also an Arabic-Latin version of book iv only,³ beginning, "postquam divisum est quod principia et elementa elementorum quae sunt secundum modum forme sunt quatuor," and ending, "et post queremus res generatas ex istis sicut homo et vegetabile et similia eorum de rebus aliis generatis."

Of the Vetus Versio, a work of the twelfth century, the first three books were probably based upon the ninth-century Arabic version

¹ A. Jourdain, *Recherches critiques sur l'age et l'origine des traductions latines d'Aristote*, Paris, 1819 (2d ed., Paris, 1843), Specimen XIV.

² Jourdain, *op. cit.*, Specimen XV.

³ Jourdain, *op. cit.*, Specimen XVI.

(from the Syriac) connected with the names of Aboul Kheir el Hassan ben Saouar and Iahya ben Bathriq,¹ and were unanimously assigned to Gerard of Cremona († 1187); the fourth book, from the Latin, was assigned by a frequently recurring explicit to "Henricus," whom Jourdain showed² to have been at least as early as Albertus Magnus and Vincent of Beauvais, and whom Rose, on the basis of the explicit of the Nuremberg MS centur. V. 59, which Jourdain did not know, has identified with Henricus Aristippus († 1162), minister of William I of Sicily.³ I quote this explicit in full from Rose:

¹ J. G. Wenrich, *De auctorum graecorum versionibus et commentariis syriacis arabicis armeniacis persicisque commentatio*, Leipzig, 1842, p. 134; M. Steinschneider, *Die arabischen Übersetzungen aus dem Griechischen*, *Centralblatt für Bibliothekswesen*, Beiheft 5, 1889, pp. 58–59; L. Leclerc, *Histoire de la médecine arabe*, Paris, 1876, I, 207. The explicit of the Cambridge MS Ee. II. 31 (see below, note 3) attributes the Arabic version to Avicenna.

² 2d ed., pp. 66, 307, 316–17. It is hard to see on what C. Marchesi (*L'Etica Nicomachea nella Tradizione latina medievale*, Messina, 1904, p. 16, n. 2) based his assertion that book iv was unknown until the fourteenth century. A number of the Vetus MSS are surely as early as the thirteenth century, and one, the Patavinus, may date from the twelfth; moreover, the Nova Versio, as we shall presently see, was completed well before 1300. The *De mineralibus* was printed at Bologna in 1501; the rest of the Vetus has never been published, so far as I know, but many of the old editions I have not seen.

³ "Henricus Aristippus" occurs also in the explicits of two Madrid MSS (Bibl. Nac. 1428, s. XIII, and 9726, s. XIV) to which attention has been called by Professor Haskins (*Harvard Studies in Classical Philology*, XXV [1914], 89, n. 2). I am indebted to Professor Haskins for copies of both these explicits.

The other MSS in which similar explicits occur—Paris 6319, 6325, Reims 865, Cambridge Ee. II. 31—call the translator of book iv simply "Henricus." They agree in assigning the first three books to Gerard ("M. G." Paris 6319). Parisinus 6325 assigns the translation of the *De mineralibus*, not to Alfred the Englishman, but to "Arelus," a name which has been commonly amended to "Aurelius," as in Parisinus 6319 (see Steinschneider, note 288); "Aurelius" also appears as a variant in the Nuremberg MS. The Cambridge MS has "Amelius." See Jourdain, 1st ed., pp. 128–29; 2d ed., pp. 66, 124; V. Rose, "Die Lücke im Diogenes Laertius und der alte Übersetzer," *Hermes*, I (1866), 385; Marchesi, p. 60; C. H. Haskins and D. P. Lockwood, "The Sicilian Translators of the Twelfth Century and the First Latin Version of Ptolemy's Almagest," *Harvard Studies in Classical Philology*, XXI (1910), 80–81; C. H. Haskins, "Mediaeval Versions of the Posterior Analytics," *ibid.*, XXV (1914), 89. I am indebted to Professor Haskins (*ibid.*, XXIII, 164) for the reference to Rose's article. A much-perverted form of the explicit occurs in Amplonianus fol. 31: "Huius libri IV transtulit magister Girardus Cremonensis de Arabico in Latinum."

For the fact that Gerard translated the first three books there is further evidence in the *Magistri Gerardi Cremonensis vita et libri translati* found in several MSS of Ali ben Rodhouan's *Tegne Galeni*; this work gives as item 38, "Liber aristotelis meteororum tractatus III, quantum autem non transtulit eo quod sane inuenit eum translatum." (See B. Boncompagni, "Della vita e delle opere di Gherardo Cremonense traduttore del secolo duodecimo," *Atti dell' Accademia dei Lincei*, IV [1851], 390,

"Completus est liber metheororum cuius tres primos libros transtulit magister Gerardus Lombardus summus philosophus de arabico in latinum. Quartum autem transtulit Henricus Aristippus de greco in latinum. Tria ultima capitula transtulit Aluredus Anglicus sarellensis de arabico in latinum."

The seventeen MSS¹ of the *Vetus* which I have examined all contain all four books; and in no case among the MSS² which I know only through catalogues—excluding MSS which purport to give only selections—does the catalogue imply that book iv is lacking. Professor Haskins informs me that book iv stands alone in Vaticanus 4439 and in a MS of the Biblioteca Nazionale at Florence (Fondo San Marco V. 45).

With only one exception—Parisinus 14718—all the *Vetus* MSS which I have examined contain, though in varying order, the *De anima* (Gr.-Lat.), *De generatione et corruptione* (Gr.-Lat.), *De sensu et sensato* (Gr.-Lat.), *De somno et vigilia* (Gr.-Lat.), *De plantis* (Arab.-Lat.), and the *De morte et vita*. Many of them contain also the *Physics* (Gr.-Lat.), *De caelo et mundo* (the second of Jourdain's Arabic-Latin versions), *De causis*, *De differentia spiritus et animae*, *De memoria et reminiscentia*, *Metaphysics* (Arab.-Lat.).

For the date of the *Nova*, which closely resembles the translations attributed to William of Moerbeka, there is clear evidence in a note in the Oxford MS Digby 153 (f. 28).³

Nota primo quod duplex est translatio libri metheororum nova et antiqua, & ideo sciendum est quod quando facta est nova translatio & quare.

446 [this reference I owe to Professor Haskins]; F. Wüstenfeld, "Die Übersetzungen arabischer Werke in das Lateinische seit dem XI. Jahrhundert," *Abhandlungen* of the Göttingen Academy, XXII [1877], 67.)

¹ Paris, Bibl. Nat., 6319, 6322, 6323, 6323A, 6325, 6569, 12953, 14718, 15452, 16082, 16142; Paris, Bibl. Mazarine, 3456; Naples, Bibl. Naz., VIII. E. 21, VIII. F. 12, VIII. E. 24, VIII. E. 43 (Marchesi, p. 15, errs in attributing to these last two MSS three books only: both contain all four); Monte Cassino VV. 8.

² Cambridge Ee. II. 31, Gonville and Caius 452, 506; Corpus Christi CXI, CXIV; Reims, Bibl. Publ., 864, 865; Tours, Bibl. Publ., 682; Erfurt, Amplonian., fol. 29, fol. 31; Wolfenbüttel, Helmst. 577; Laurentiani Bibl. S. Crucis XIII. 4, XIII. 5, XIII. 12, XIV. 1, XV. 1; Laurentianus Bibl. Leopold. Stroz. 22 (wrongly ascribed to s. XII; see C. H. Haskins, *Harvard Studies in Classical Philology*, XXV, 88, n. 1); Padua, Bibl. di Sant' Antonio, XX. 428 (ascribed by the cataloguer to s. XII); Escorialensis f. II. 4.

³ For the transcript of this note I am indebted to Mr. H. Craster of the Bodleian Library. Similar notes occur in Mertonensis 281 and Laurentianus 84. 17, in which last MS the date given is not 1260 but 1268.

& dico quod anno domini millesimo ducentesimo sexagesimo translatus est textus de greco in latinum apud niceam urbem & similiter cum hoc translata est expositio Alexandri afrodisii. causa fuit quod antiquus textus est in multis corruptus & discordans a verbo & sententia philosophi; nec mirum, quia libri aristotelis translati fuerunt primo de greco in arabicum & deinde ab arabico in latinum, & non fuerunt iste translationes facte de verbo ad verbum sed de sententia ad sentencias, & ideo in multis est diminutus & in quantitate minor quam nova translatio, & multe partes deficiunt, & aliqua que non sunt de textu aristotelis adduntur; nam capitulum de figura yridis totaliter deficit in antiqua translatione & ultimum capitulum in antiqua translatione quod sic incipit 'terra pura lapis non fit' non est capitulum aristotelis sed additum ab alueredo, ut dicit bacun in sua naturali philosophia capitulo secundo secundum albertum 3 mineralium c. 9, & contraria per totum librum suum patet quod illud capitulum est avicenne.

MSS of the Nova are numerous and generally very long, often containing more than twenty-five works (always Greco-Latin, so far as I have noted, except for the frequently occurring *De plantis* and *De causis proprietatum elementorum*). In Parisinus 16097 at the end of Proclus' *Elementatio theologica* occurs the note: "Completa fuit translatio huius operis viterbii a fratre G. de Morbecca ordinis fratrum predicatorum 15^{mo} Kalendas junii anno domini m^o cc^o sex^{mo} octavo" (cf. Quétif et Échard).

The Arabic-Latin version of book iv, referred to as the "Vetus" by De Asula's edition (Venice 1483), may or may not have been earlier than Gerard's work. Though the words of the *vita et libri* are scant and imply nothing as to the source of the version which Gerard found already made, it would be natural to suppose, since Gerard's source was Arabic, that the source of the older version was likewise Arabic; yet Gerard's work, in all the MSS which I have examined, is followed, not by the Arabic-Latin book iv, but by Henry's Greco-Latin book iv. Moreover, so far as the words of the *vita et libri* are concerned, there may have been, to Gerard's knowledge, more than one earlier translation of book iv. We are therefore left without any evidence as to the date of the anonymous Arabic-Latin version. If, as Jourdain suggests, this anonymous version was the work of Michael Scot, who is said to have written *Contra Averroem in Metheora L. I*, its date was early thirteenth century—not many years before 1243, when Parisinus 15453 was written. The only other MS of which I know is the Marcianus

L. VI. LII, said to be of the fourteenth century; this MS, which I have not seen, it would be interesting to examine with the idea of discovering whether it was used for De Asula's edition.

In a text which, like that of the *Meteorology*, is based upon a number of old MSS, a study of the Latin versions cannot be expected to prove as profitable as in texts based wholly or in greater part upon late MSS. I have therefore not attempted to do for the versions of the *Meteorology* anything like what Spengel and Susemihl have done for the *Rhetoric* and the *Politics* respectively, much less what Thurot has done for Alexander's commentary on the *De sensu et sensibili*, or what Schneider, Dittmeyer, and Rudberg have done for the *Historia animalium*. I have, however, in book iv, which is particularly interesting because of the presence of an additional version from the Greek, collated eight MSS: for the Arabic-Latin I copied out the text of De Asula as a basis and collated upon it Par. 15453, a. 1243; for the Vetus I copied out the text of Par. 12953, s. XIII, and upon this as a basis collated Par. 6325, s. XIV, and Par., Bibl. Mazarine, 3456, s. XIII; for the Nova, disregarding the editions, I copied out as a basis Par. 6297, s. XIV—according to Thurot, one of the two best of the MSS which he collated—and upon this collated Par. 16088, s. XIII, and 16145, s. XIII/XIV, and Neapolitanus (Bibl. Naz.) VIII. E. 24, s. XIII.

Having no knowledge of Arabic, I have not tried to draw inferences from the discrepancies between the Arabic-Latin version and the Greek text. How extraordinarily wide some of these discrepancies are, especially in the expansions and the numerous contractions, is shown by a glance at De Asula; even after exercising the caution recommended by Leclerc (I, 210-11), one can readily believe that the Arabic may have been only the translation of a translation. Nor have I tried to note any of the principles and mannerisms of the Latin translator, partly from a belief that this could not be intelligently done without knowledge of Arabic, partly from a feeling that, however well done, it might prove to have little value.

The characteristics of the Nova are sufficiently well known from the work of Thurot and of Rudberg. In the following scattering and unsystematic notes on the characteristics of the Greco-Latin

Vetus the citations from the Nova are given for the sake of comparison only.

In his treatment of particles and connectives Henry is notably free. *μέν* he translates by *quidem*, *vero*, or *utique*, or sometimes omits altogether: in the Nova the omission of *μέν* at 380b10 is exceptional; it regularly appears as *quidem*. *δέ*, regularly *autem* in the Nova, is sometimes omitted and sometimes translated by *autem*, *quidem*, *nempe*, *-que*, *vero*, *sane*, *itaque*, *certe*, *quoque*, *profecto*, *utique*, *sed*, *atqui*. *γάρ*, regularly *enim* in the Nova, is sometimes omitted and sometimes translated by *enim*, *etenim*, *quia*, *quoniam*, *nam*, *namque*, *quippe*, *siquidem*, *nimirum*. *μὲν οὖν*, regularly *quidem igitur* in the Nova, is translated by *ergo*, *itaque*, *igitur*, or *autem*. *καθάπερ*, *sicut* in the Nova, is translated by *sicut* or *ceu* or omitted. *οἷον*, *puta* in the Nova, is *quemadmodum* or *ceu*. *ὥστε*, *quare* in the Nova, is *quas ob res*, *qua de causa*, *ut vero*, or *unde*. At 379b28 *ἡ . . . ἡ . . . ἡ . . . ἡ*, *aut . . . aut . . . aut . . . aut* in the Nova, is rendered *vel . . . aut . . . sive . . . sive*. *ὅταν*, *quando* or *cum* in the Nova, is *quando*, *cum*, or *quotiens*. *διό*, *propter quod* in the Nova, is *idcirco*, *propterea*, *eapropter*, *quapropter*. *οὐ*, *non* in the Nova, is *non*, *minime*, *nequaquam*. *ἄν* with the optative, in the Nova regularly *utique* and the future indicative, is sometimes rendered by the future indicative alone. In certain cases, however, his preference for a particular rendering is almost as decided as that of the later translator:

	Vetus	Nova
<i>ὥσπερ</i>	<i>quemadmodum</i>	<i>sicut</i>
<i>ὅτι</i> = "because"	<i>quoniam</i>	<i>cum</i>
<i>δή</i>	<i>sane</i>	<i>itaque</i>
<i>εἴτα</i>	<i>dehinc</i>	<i>deinde</i>

In the use of adverbs there is, as we should expect, less variety:

	Vetus	Nova
<i>οὐτω</i>	<i>ita</i>	<i>sic</i>
<i>πόρρω</i>	<i>porro</i>	<i>longe</i>
<i>μάλιστα</i>	<i>maxime, praecipue</i>	<i>maxime</i>
<i>πλέον</i>	<i>magis</i>	<i>amplius</i>
<i>ἰδίως</i>	<i>proprie</i>	<i>singulariter</i>
<i>οὐδέν</i>	<i>minime</i>	<i>nihil</i>
<i>δλως</i>	<i>omnino</i>	<i>totaliter</i>

In the difficult matter of the article (see Rudberg, p. 39) the Vetus omits more often than does the Nova: *ἐκ δὲ τῶν τοιούτων τὰ γεηρὰ συνίσταται*, *ex talibus vero terrea constant* Vetus, *ex talibus autem que terrestria consistunt* Nova; *ἡ ἔξωθεν θερμότης*, *exterior caliditas* Vetus, *que deforis caliditas* Nova. Sometimes this omission entails obscurity, e.g., *τῷ γὰρ μὴ κεκρατῆσθαι*, *non enim vinci* Vetus, *eo enim quod non sunt obtenta* Nova; yet fully as often the obscurity is on the side of the Nova, e.g., *τῷ πάσχειν τι*, *in eo quod patiatur quid* Vetus, *in pati aliquid* Nova.

In the rendering of participles the Vetus does the less violence to Latin idiom: *τὰ ἐν τοῖς φύμασι συνιστάμενα*, *ea quae in nascentiis constant* Vetus, *quae in nascentiis constantia* Nova; *τῶν φύσει συνεστώτων*, *eorum que natura constant* Vetus, *natura constantium* Nova.

Technical Terms	Vetus	Nova
ὕγρὸν	<i>liquidum, humidum</i>	<i>humidum</i>
ὕγρότης	<i>humor</i>	<i>humiditas</i>
ψυχρὸν	<i>gelidum, algidum, algens</i>	<i>frigidum</i>
ψυχρότης	<i>frigus</i>	<i>frigiditas</i>
τὸ θερμὸν	<i>calor, calidum</i>	<i>calidum</i>
θερμασία	<i>calefactio</i>	<i>caliditas</i>
θερμότης	<i>calor, caliditas</i>	<i>caliditas</i>
ὑποκείμενον	<i>subiectum</i>	<i>suppositum</i>
ἐκκριθὲν	<i>disgregatum</i>	<i>segregatum</i>
ποιητικόν	<i>activum</i>	<i>factivum</i>
περιέχον	<i>continens</i>	<i>ambiens, circumdans</i>
φανερὸν	<i>clarum</i>	<i>manifestum</i>
λόγος = ratio	<i>proportio</i>	<i>ratio</i>
τελείωσις	<i>completio</i>	<i>perfectio</i>
συμβαίνειν	<i>evenire, contingere</i>	<i>accidere</i>
ὑπάρχειν	<i>inesse</i>	<i>existere</i>
γεννᾶν	<i>gignere</i>	<i>generare</i>
κρατεῖν	<i>vincere</i>	<i>optinere</i>

In general the Vetus is freer than the Nova: it more often shifts to the really equivalent construction, it more often varies the order, and it more often inserts a word to make the meaning clearer. Yet there are exceptions: *ληπτέον ἂν εἴη*, *assumere erit* Vetus, *sumendum utique erit* Nova; *κρατῇ τοῦ ὀρίζοντος τὸ ὀριζόμενον*, *vincit terminans terminatum* Vetus, *id quod terminatur optineat terminans* Nova; *ἡ τοῦ φυσικοῦ θερμοῦ τοῦ ἐνόντος ὑγροῦ πέψις*, *a naturali calore inherentis humidi digestio* Vetus, *que a naturali calido digestio existentis humidi* Nova.

The relation of the Nova to the Greek MSS has been in part determined by Thurot,¹ who pointed out that the Nova shared a few readings with E, and many more with F. I do not know how much of the Latin text Thurot had collated, nor what relation that text may bear in the first three books to J, F, the Matritensis, and the Ambrosianus and 1880; but in book iv I see little evidence of a closer relationship with F than with 1880 (which Thurot had collated; see "Textual Problems in Aristotle's *Meteorology*," in the April number). The version is no doubt contaminated, perhaps from several sources, but its origin seems fairly clear: the Nova is derived from the ancestor of the group comprising J, F, the Matritensis, and 1880:

379a17 καὶ om. J F₁ Matrit. 1880₁ Nova.

381a12 δὲ ἀπειψία μὲν ἢ ἐναντία] δὲ ἀπειψία μὲν ἐναντία δ' J F₁ Matrit.
1880 δὲ ἀπειψία μὲν ἢ ἐναντία δ' F_{corr.} δὲ (δ') ἀπειψία ἢ ἐναντία E 314
δ' ἐστὶν ἀπειψία ἐναντία Olympiod. *autem indigestio quidem contraria autem Nova.*

382a33 ἀπουσία ἢ παρουσία] Olympiod. ἀπουσία 314 παρουσία ἢ ἀπουσία J F Matrit. 1880 edd. *in presentia aut absentia Nova.*

383b10 λυτὰ] λύεται J F Matrit. 1880 Bek. *solvuntur Nova.* (Bekker's apparatus wrongly implies that H and N read λύεται.)

383b22 εἰ δὲ γῆς πλείον (πλέον, πλίον) ὑπὸ πυρός] ὥς οἱ πάγοι (ὥς ὁ πάγος F_{rec.} ὥς οἱ πῶροι 314) εἰ δὲ γῆς πλείον ὑπὸ πυρός ὥς ὁ κέραμος 314 (contaminated) J F Matrit. 1880 edd. *ut glacies si autem terre plus ab igne ut later Nova.*

383b27 ὕδωρ καὶ ἔλαιον] εἰ. καὶ ὕ. J F Matrit. 1880 *oleum et aqua Nova.*

384a34 κέραμος] κέραμος καὶ λίθος J F Matrit. 1880 Olympiod. *later et lapis Nova.*

385a14-16. The Nova has the same transposition as J F Matrit. 1880 (see above, pp. 199, 210).

385a30 πάντα] ταῦτα J F Matrit. 1880 *haec Nova.*

385b2 μηδὲ] μῆτε 314 ἢ μὴ J F Matrit. 1880 om. Olympiod. *aut non Nova.*

Agreements between the Nova and J F alone and between the Nova and Matrit. 1880 alone are so slight as to be negligible; possibly the Nova has been contaminated from J:

381b16 οἶον] ὁμοιον E edd. om. J Nova *quemadmodum Vetus.*

384b10 μηδὲ (μηδ') μὴ J Olympiod. *minime Vetus non Nova.*

¹ *Rev. archéol.*, XX, 420.

Among the more serious individual errors of the Nova are:

383a3-4 ὑγρὸν ψυχρόν, τὰ δὲ ὑπὸ ψυχροῦ παγέντα ὑπὸ πυρὸς λύεται, ὃ ἐστὶ θερμόν] *et circa quae humida Nova.*

387b20-21 φλόγα . . . φλογιστὰ ὅσα om. Nova. (The reading δύναιται παρέχεσθαι, attributed by Bekker to H alone, is shared by F.)

The relation of the Vetus to the Greek MSS can be determined with about equal certainty. The Vetus belongs with E and 314:

379a25 σπῶν] ἐπάξον E₁ 314 *inducens* Vetus.

380a16 πέποινα καὶ ἄλλα πολλὰ] καὶ ἄλλα πολλὰ πέποινα E 314 edd. *etiam* (om. 3456) *multa* (*alia* 6325) *alia* (*multa* 6325) *pepaina* (*pepaina* 3456) Vetus.

382b33 θερμῷ ξηρῷ ἢ ψυχρῷ] ψ. ἢ θ. ἢ ξ. J Matrit. ψ. ἢ ξ. ἢ ὑγρῷ (ἢ ὑγρῷ del. m. 1) ἢ θ. F (Bekker's report is wrong) θ. ἢ ψ. ἢ θ. ἢ (ἢ eras.) ξ. 1880 θ. ἢ ψ. ἢ ξ. E 314 *calido vel* (*et* 12953) *gelido vel arido* Vetus.

383a10 τοῦ ψυχροῦ] ὑπὸ ψυχροῦ E 314 *a gelido* Vetus.

385b29 ἀκαμπτα μὲν καὶ (τὰ H) ἀνεύθυντα ὅσων σωμάτων οὐ δύναται τὸ μῆκος] καμπτὰ μὲν καὶ εὐθυντὰ ὅσων (ὧν E) σωμάτων τὸ μῆκος δύναται E 314 *lenta et indirectiva corpora quorumcumque longitudo potest* 12953 *lenta et directiva quorumcumque corporum longitudo potest* 6325 *lenta et directiva quorumcumque corporum permutari potest longitudo* 3456 (Bekker's report of H is wrong).

387b11 οὐκ ἔστιν] οὐκ ἐτι E 314 *nondum* Vetus.

387b16 ταῦτα] ἅπαντα E 314 *cuncta* Vetus.

388a6 μόνα] μόνον E 314 *solum* Vetus.

388b27 ὥς om. E 314 Vetus.

389a2 ταῦτα om. E 314 Vetus.

The occasional agreement of the Vetus with E alone or with 314 alone I attribute to chance or to contamination, since the Vetus is free from many errors common to E and 314:

379b3 ἥ] om. E 314 *quam* Vetus.

379b24 δι'] om. E 314 edd. *per* Vetus.

380b25 ἐν λίθοις] λίθος E₁ λίθοις 314 *in lapidibus* Vetus.

386a7 ἄλλο καὶ ἄλλο καὶ] ἄλλο καὶ E 314 *aliud atque* (*et* 3456) *aliud et* Vetus.

387b24 καπνοῦ] καπνόν E 314 *fumi* Vetus.

388b8 πληθός] πληθῆι F_{var.} 1880_{var.} E 314 *multitudinem* Vetus.

388b25 καὶ] ἢ E 314 N edd. *et* Vetus. (Bekker wrongly implies that H has ἢ.)

390b8 θερμοῦ καὶ ψυχροῦ] ψ. καὶ θ. E 314 edd. *calido et frigido* (*calido facto* 12953) Vetus.

If in these last instances one chooses to see only evidence of contamination, the value of the Vetus becomes distinctly less; so far

as I have gathered the evidence, however, it seems quite unnecessary, in spite of the wide divergence of the Vetus MSS, to suppose serious contamination from other sources than H N; contamination from H N is proved by 385b10, where, in H N, *ἐκτὰ* is followed by *οἶον νεῦρον ἰμάς*; the Vetus here has the additional words *velud nervus corrigia*.

On general principles, then, in so far as its position in the stemma is concerned, the Vetus should have in book iv about the same value as the Nova presumably has in books i and ii—greater value than the Nova has in books iii (presumably) and iv. But because of the peculiarities of E 314 I believe that in book iv the Vetus has more value than at first appears, and that it would be worth editing.

At 379b23 Henry's *quemadmodum cibarium per iter digeritur et per balnea et per alia similia* seems at first thought to offer something which has dropped out of our MS tradition; and *διὰ πορείας* would fit into a nine-letter line (see above, p. 208); but Alexander paraphrases, *ὡς λουτρά, γυμνάσια* (I quote Hayduck's text, disregarding the puzzling variants, none of which can well be connected with *per iter*), and Olympiodorus paraphrases, *διὰ τροφῶν θερμῶν καὶ λουτρῶν ἢ ἄλλων τοιούτων*.

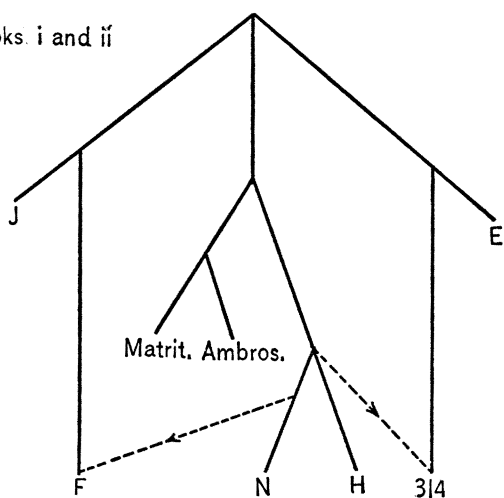
The stemmata which follow are based largely on the conclusions of my article in the April number. They do not indicate the contamination of F from E 314.

For purposes of comparison I give the first chapter of book iv as it appears in the three versions already mentioned and in a fourth version or paraphrase—for I do not know what it is or whence it comes¹—found between books iii and iv in Parisinus 6325, s. XIV (f. 107), and comprising only this one chapter.

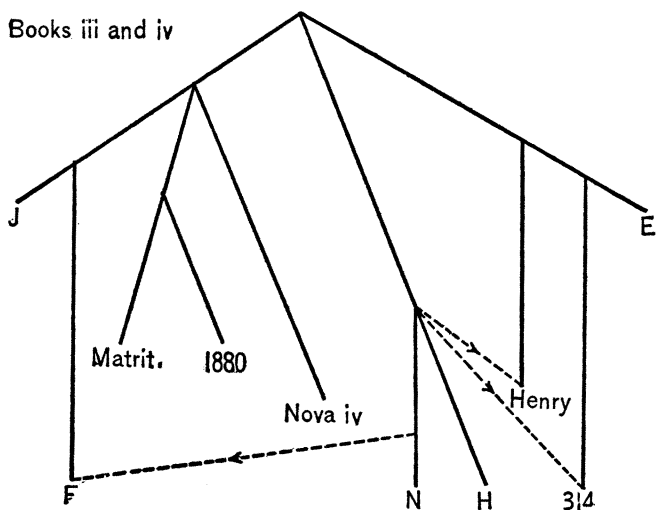
Sigla		
Parisini	6297.....	<i>α</i>
	16088.....	<i>β</i>
	16145.....	<i>γ</i>
Neapolitanus	VIII E. 24.....	<i>δ</i>
Parisini	12953.....	<i>π</i>
	6325.....	<i>ρ</i>
	3456 (Bibl. Mazarine).....	<i>ς</i>
	15453.....	<i>φ</i>

¹ Opposite the explicit of book iii there is a marginal note: "Non quod ab isto loco usque ad finem istius libri non est in multis aliis libris"; and opposite the beginning of the old Greco-Latin book iv another marginal note (in red): "Hic incipit .4. secundum plurimum."

Books i and ii



Books iii and iv



STEMMATA OF *METEOROLOGY* MANUSCRIPTS

In the Vetus and the Nova I have in the main followed π and α respectively, noting most of my divergences from them. In the Arabic-Latin version I give full critical notes. The fourth version I have tried to print exactly as it stands in ρ , the one MS in which I have found it; and here I have taken no liberties with the punctuation, whereas in the first three versions I have adapted the punctuation of Bekker. For help in a paleographical difficulty in the fourth version I am indebted to Professor E. K. Rand and to Dr. H. W. Litchfield.

Arabic-Latin

Postquam divisum est quod principia et elementa (et elementa *om.* De Asula) elementorum quae sunt secundum modum forme sunt quatuor, sicut est numerus elementorum ex quibus componuntur, et duo sunt (et sunt duo ϕ) activa et sunt calor et frigus, et duo passiva et sunt humidum et siccum, et signum huius est quod calor et frigus sunt ambo quae componunt res ad se invicem et admiscunt quousque res nova generetur, et universaliter iste due potentie et virtutes sunt quae mutant creaturas convenientes in genere unam in aliam, sed siccitas et humiditas sunt passiva in seipsis (seipsas ϕ) istarum duarum qualitatum et per illas duas patiuntur omnia composita, et signum huius est quod etiam (est quia ϕ_1) antiqui diffiniunt cum istis distinctionibus (diffinitionibus ϕ) illas, et nominaverunt illas nominibus istorum, et dixerunt quod calor et frigus erant virtutes operantes, et humiditas et siccitas erant virtutes operate, et diffinierunt humidum facile ad separationem ab alio per aliquod grave concludi per se, et diffinierunt siccitatem per contrarium, et (*om.* ϕ) volo dicere quod sit grave separari ab alio leve concludi in se, sed diffinierunt frigus quod aggregat etherogenea et homogenea, et diffinierunt calorem quod (quod est quod ϕ) aggregat homogenea et separat etherogenea, et postquam hoc est certum, iam manifestum (hoc certum De Asula) est quod principiorum simplicium duo sunt activa et duo passiva, et postquam manifestum est quod ista elementa sunt duo (ista sunt De Asula) activa et duo passiva, iam convenit quod remoremur modos operationum activarum et modos passivarum, et dicamus quod generatio et corruptio absoluta naturalis est mutatio quae accidit rebus compositis materialibus (in animalibus ϕ) secundum proportionem mensurarum et (*om.* ϕ) mitionis harum virtutum ad se invicem in subiecto compositi. et propter victoriam virtutum passivarum super activas evenit putrefactio, quae est causa corruptionis et dissolutionis, scilicet dissolutionis (scilicet dissolutionis *om.* De Asula) partium compositi;

et ideo (compositi; omnino ϕ) putrefactio absoluta est contraria generationi absolute; et per illam est corruptio naturalis, sicut putrefactio in sanguine (sene De Asula) multum. et est vetustas magna. et generata quae sunt corpora corrumpuntur aut propter victoriam humiditatis in illis in principio; et post siccitatis in fine (extrema ϕ). et quando (quia ϕ) sunt ambo scilicet siccum et humidum in mensura communi et in modo quo vincunt virtutes operative super illa, et miscent illa quosque habeant (habeat De Asula) substantiam et statum proprium in composito, et (*om.* De Asula) tunc fit illud (id ϕ) generatum. et illa (ista ϕ) est intentio eius quod dicitur quod generatio est quando vincit terminans terminatum, et corruptio est quando vincit terminatum terminans. et elementum quod est causa generationis prima antecedens operans et seperans (et seperans *om.* ϕ) in rebus compositis est ignis. et illud (id ϕ) est quia (quod ϕ) aer et aqua et terra destruuntur (aer et quod aqua cito destruunt ϕ) per ignem, et elementa omnia sunt subiecta igni. et ignis est operans in illa et vincens illa. putrefactio autem (*om.* ϕ) est corruptio caloris naturalis qui est in generato, quando humefit res cum humiditate accidentali; et corruptio eius est propter calorem extraneum existentem a natura. et est calor qui est in aere circumstanti. et quando privatur generatum a calore suo naturali et corrumpitur et convertitur in frigidum tunc et fit privatio (convertitur tunc frigidum tunc privatio est ϕ) caloris naturalis et victoria frigoris, et post istum supersunt (sunt ϕ) due cause corruptionis. et (*om.* ϕ) principium cause putrefactionis est frigus modicum quod (quod cum quod ϕ) accidit generato. et non (et non *om.* ϕ) habet calor estraneus in hyeme putrefacere (inde putrefacere res ϕ) tantam quantam in estate. et causa huius est quia frigus in tempore hyemis habet posse magnum super aquam et aerem, sed (scilicet ϕ) in estate est putrefactio (putrefacto De Asula) magis quam in hyeme. et frigiditas (frigus ϕ) aquae est maior quam calor aeris et intensior. et ideo admiscetur aer cum aqua et temperatur (temperatum ϕ) et admiscetur cum ea (eo ϕ). et si essent equales et (aut ϕ) equipotentes et parificarentur, non admiscerentur nec temperarentur. et operans et movens est res quae (movens res est quod De Asula) comprehendit et circumdat res et coniungit. et calor qui est in aere est minor calore naturali quem emittit (admittit De Asula) res in sui perditione. et propter hoc non est calor aeris comprehendens et constringens rem suam (*om.* ϕ), sicut facit calor (*om.* De Asula) naturalis in illa. et corruptio rei moventis per calorem aeris circumstantis est minor quam corruptio rei quiescentis (quam corpore requiescens ϕ). et quoniam (quia ϕ) calor aeris est debiliior quam calor naturalis, perseverat et non festinat in eis corruptio propter calorem aeris. et propter istam rem fetet aqua maris quae recedit ab illo, et mutatur. et hoc non accidit universe aque maris. et postquam manifestum est quid sit generatio et corruptio, . . .

Vetus

Quoniam quidem quatuor cause determinate sunt elementorum, harum quidem iuxta coniugaciones et elementa quatuor contingit esse, quarum sane (sunt π) due active, calidum et frigidum (active, frigidum et calidum π), due vero passive, aridum et humidum; fidesque eorum ex inductione; apparet (apparent π) namque in (*om.* π) universis caliditas atque frigiditas terminantes atque permutantes unigena et non unigena, atque humectantes atque arefacientes necnon indurantes et mollificantes, arida nempe (namque π) et humida terminata et alias dictas tollerancia passiones ipsa quidem secundum se ipsa et quecumque communia ex ambobus corpora constant. amplius equidem ex rationibus perspicuum quibus determinamus naturas eorum; nam calidum et gelidum activa dicimus (quia congregatum velud activum quidem) liquidum quidem et siccum passiva (quoniam facile terminabile et difficile terminabile (*om.* π) in eo quod patiat quid dicitur natura eorum). quoniam igitur hec quidem activa illa vero passiva clarum; determinatisque istis assumere erit operationes eorum, quibus operantur activa, et passivorum species. primum itaque universaliter simplex generatio et naturalis permutatio harum virtutum est opus, et contra iacens corruptio secundum naturam. hee autem plantis insunt et animalibus et partibus eorum. estque simplex et naturalis generatio (simpliciter generacio et naturalis π) permutacio ab hiis virtutibus, quando (que π) habent proportionem ex subiecta materia unicuique nature. hee vero sunt dicte virtutes passive. gignunt autem calidum et frigidum vincencia materiam; cum vero non vincunt agentia, liquet quoniam secundum partem molinsis et indigestio fit. simplici sane generacioni contrarium praecipue commune putrefactio; omnis quippe secundum naturam corruptio in hoc (hac π) via est, quemadmodum senectus et vetustas. finis enim horum cunctorum putredo, nisi quid violentia corrumpatur eorum que natura constant; est etenim carnem et os et quidlibet comburere (os conburere et quidlibet π) quorum finis secundum naturam corruptionis putrefactio sit. ideo humida primum, dehinc arida ad ultimum (adhuc π) fiunt putrefacta; ex hiis quippe facta sunt et determinatum est humido siccum operantibus activis. fit (*om.* π) itaque corruptio, quotiens vincit terminans terminatum per continens. nec (nunc π) non proprie dicitur putrefactio secundum partem in corruptis, cum separentur a natura. iccirco et putrefiunt universa reliqua praeter ignem; et enim terra atque aqua necnon aer putrescunt; cuncta siquidem materia igni erunt hec. putrefactio vero est corruptio in unoquoque humido proprie et secundum naturam caliditatis ab aliena caliditate; hec autem est eius quod est (autem est quod π) continens. quas ob res quoniam secundum indigentiam patitur calidi, cum sit (fit π) indigens talis virtutis algidum omne, ambo utique cause erunt et communis passio putrefactio, geliditatisque proprie et caliditatis aliene. propter hoc siquidem et sicciora fiunt putrefacta (sicciora putrefacta sunt π)

universa, et extremo terra atque fimus; exeunte enim proprio calido simul exalatur quod (quoniam π) secundum naturam humidum est (humidum est *om.* π) et inducens humorem non est. inducit quippe attrahens calor. atque in frigoribus certe minus putrescit quam in estu; quoniam in hyeme paucum in continenti aere et aqua calidum, qua de re minime praevallet, in estate quoque (quocumque π) magis. neque coagulatum (magis enim gelidum quam aer calidus; non itaque vincit movens utique vincit) neque fervens prout calidum; minor enim in aere calor quam (calor in eo quam π) in re; qua de causa nequaquam vincit neque facit permutationem quamlibet. similiter quoque et motum et fluens minus putrescit non motu; infirmior siquidem fit ab eo qui in aere calore motus eo qui in re (ere π) inheret; unde minime facti permutationem. eadem causa multum minus paucum putrefaciendo; in eo enim quod plus est plus ignis proprius et frigiditas quam ut vincat que in circumstanti virtutes. eapropter mare secundum partem nempe divisum cito putrescit; universum vero numquam, et ceterae aquae non dissimiliter. atque animalia innascuntur putrefactis eo quod disgregans caliditas naturalis cum sit constare facit disgregata. quid ergo sit (*om.* π) generatio et quid corruptio dictum est.

Nova

Quoniam autem quatuor causae determinatae sunt elementorum, harum autem secundum coniugationes et elementa quatuor accidit esse, quorum duo quidem factiva, calidum et frigidum, duo autem passiva, siccum et humidum; fides autem horum et inductione; videtur enim in omnibus caliditas quidem et frigiditas terminantes et copulantes et permutantes et homogenea et non homogenea, et humectantes exsiccantes et indurantes et mollicantes, sicca autem et humida terminata et alias dictas passiones patientia ipsaque secundum se et quaecumque communia ex ambobus corpora constant. adhuc autem ex rationibus palam quibus determinamus naturas ipsorum; calidum quidem enim et frigidum ut factiva dicimus (concretivum enim sicut factivum aliquid est) humidum autem et siccum passiva (facile terminabile enim et difficile terminabile in pati aliquid naturam ipsorum dicitur). quod quidem igitur haec quidem factiva haec autem passiva manifestum; determinatis autem hiis sumendum utique erit operationes ipsorum, quibus operantur factiva, et passivorum species. primo quidem igitur universaliter simplex generatio et naturalis permutatio harum virtutum est opus, et opposita corruptio secundum naturam. haec quidem igitur plantis existunt et animalibus et partibus ipsorum. est autem simplex et naturalis generatio permutatio ab hiis virtutibus, cum habeant rationem ex subiecta materia unicuique naturae. haec (*om.* α) autem sunt dictae virtutes passivae. generant autem calidum et frigidum optinentiam materiam; cum autem non optineant, secundum partem quidem molinsis et indigestio fit. simplici autem generationi contrarium maxime

commune putrefactio; omnis enim secundum naturam corruptio in hoc via est, puta senectus et auansis. finis autem omnium aliorum horum putredo, nisi aliquid violentia corumpatur natura constantium; est enim et carnem et os et quodcumque comburere quorum finis secundum naturam corruptionis putrefactio est. propter quod humida primo, deinde sicca tandem fiunt putrefacta; ex hiis enim facta erant et terminatum fuit humido siccum operantibus factivis. fit autem corruptio, cum id quod terminatur optineat terminans propter circumdans. quin immo singulariter dicitur putrefactio in hiis que secundum partem corrumpuntur, cum separentur a natura. propter quod et putrescunt omnia alia excepto igne; et enim terra et aqua et aer putrescunt; omnia enim haec sunt materia igni. putrefactio autem est corruptio quedam in unoquoque humido proprie secundum naturam caliditatis ab aliena caliditate; haec autem est que ambientis. quare quoniam secundum indigentiam patitur calidi, indigens autem tali virtute existens frigidum omne, ambe utique causae erunt et putrefactio (putrefactio et $\alpha\beta\delta$) communis passio, frigiditatisque proprie et caliditatis aliene. propter hoc (quod $\alpha\beta\gamma$) enim et (in $\alpha\beta\gamma$) sicciora fiunt putrefacta omnia, et tandem terra et fimus; exeunte (existente $\alpha\beta\gamma$) enim proprio calido coevaporat quod secundum naturam humidum, et trahens humiditatem non est. adducit enim trahens propria caliditas. et in frigoribus autem minus putrescunt quam in estu; in hyeme quidem enim paucum in ambiente aere et aqua calidum, quare nichil potest, in estate autem amplius. et neque quod coagulatum (magis enim frigidum quam aer calidus; non igitur optinetur, aut optinet) neque fervens quam (quae $\beta\gamma$) calidum; minor enim que in aere caliditas ea que in re; quare non optinet neque facit permutationem neque unam. similiter autem et quod movetur et fluit minus putrescit quam non motum; debilior enim fit motus qui ab ea que in aere caliditate quam qui in re praeexistit; quare nichil facit permutari. eadem autem causa et quare multum minus paucum putrescit; in maiori autem amplior est ignis proprius et frigidum quam ut optineant quae in circumstante virtutes. propter quod mare secundum partem quidem (*om.* $\beta\gamma$) divisum cito putrescit, totum autem non, et alie aque eodem modo. et animalia fiunt in hiis quae putrescunt propterea quod segregata (non igitur optinetur . . . segregata *om.* α) caliditas naturalis existens constare facit segregata. quid quidem igitur est generatio et quid corruptio dictum est.

Parisinus 6325

Capita primitiva elementorum quatuor. sunt quatuor sicut elementa composita. ex quibus sunt duo elementa agentia. et duo elementa patientia. verum duo (*ex* duorum *corr.*) elementa agentia sunt caliditas et frigiditas. et duo quidem elementa patientia. sunt humiditas et siccitas. illius vero demonstratio est. quod caliditas et frigiditas sunt distinguendos res

et componentes eas et mutantes generata convenientia in (*ex* generata in *corr.*) genere. et indurantes et humectantes. humiditas autem et siccitas patientes sunt per se ipsas. et patiuntur propter eas omnia corpora composita ex eis. illius autem demonstratio est sermo antiquorum in utrisque et determinatio earum est id quo determinaverunt eas. quod est. quoniam ipsi dixerunt quod caliditas et frigiditas sunt agentes. et humiditas et siccitas sunt patientes. et nominaverunt humiditatem velocis motus et siccitatem vehementis continuationis. quod est. quoniam ipse leduntur et patiuntur. iam ergo manifestum est quod elementorum quatuor duo sunt agentia et duo patientia. et quia iam manifestum est illud. tunc dicamus operationem agentium et species patientium in eis. dico ergo quod generatio et corruptio universalis et mutatio naturalis sunt ex vehementia virtutum quas diximus. et sunt in plantis. et scitis quod universale et particulare et generatio naturalis. universalis facta sunt ex istis virtutibus quando permiscetur materia omni speciei ex speciebus huius mundi inferioris. et illud est quia quando sunt due virtutes agentes magis vincentes in generatione. non corumpitur illa generatio et non leditur. et illud est. quando non est inter utrasque contrarietas neque alteratio. et est unaquaeque earum stans per se. quando vero due virtutes patientes sunt magis vincentes. in illa generatione. fit ex eis putrefactio et corruptio et resolutio. et mutatio est contraria generationi universali. et ex ea fit corruptio naturalis. sicut senium. et siccitas perimens. et cinis quidem est similis ei quod corumpitur ex istis rebus. quando autem corumpuntur generata naturalia ex generatione vincente ea. tunc finis illius generationis est putredo sicut caro et ossa et quae sunt eis similia ex generatis quibus accidit corruptio et combustio. et generata quidem corruptibilia. sunt in primis humida. deinde exsiccantur postremo. et corruptio fit quando vincit terminans terminatum. quoniam invenit ipsum suo termino comprimit ipsum. generata autem particularia corumpuntur. quando mutantur a naturis suis. elementa igitur alterantur in se adinvicem praeter ignem. aqua autem et aer corumpuntur per alterationem velociter. et res omnes sunt submissae igni. et ignis est agens in eis. putrefactio vero est corruptio caliditatis naturalis per caliditatem extra naturam. iste autem operationes sunt adherentes aeri continenti nos proprie. et quando privatur generatio caliditate sua innata. leditur et corumpitur. et fit frigida. privatio autem caliditatis (*ex* a caliditatis *corr.*) innate. et frigus vincens potius (*ex* potius *po corr.*) illud sunt corruptio illius generationis. et quando putrefiunt res. et exsiccantur. fiunt post illud (*ex* illb *illd corr.*) terra et fimus. quod est. quoniam caliditas est retinens humiditatem naturalem. et attrahens eam. et quando separatur caliditas innata a generatione. non est illic retinens humiditatem. quare resolvitur propter illud et exsiccat et arescit illa generatio. et exsiccat post illud. principium autem causae generationis putredinis. est frigus parvum

quod accidit generationi. quare accidit caliditati innate ex natura in re. et agit in ea (*ex causa ea corr.*) et putrefacit eam. et si non esset quod frigus comprimit caliditatem innatam et prohibet ipsam a resolutione. resolveretur ex re in qua ipsa est et separaretur ab ea et non putrefaceret ipsam. et non potest caliditas putrefacere res in yeme sicut putrefacit eas in estate. quod est. quoniam frigus est vincens super aquam et aerem victoria vehementi. ergo quod est in rebus de caliditate innata est pars pauca. non potens super (*ex supers corr.*) putrefactionem. et propter illud fit in ea glacies et siccitas. quoniam putrefactio est per modum quem diximus. et res quidem ultime in digestionem. sunt vehementioris mollificationis quam illae quarum digestio non completur. et sunt duriores. quam ultime in digestionem.

LEXINGTON, MASS.